

XIII. *The life-history of Spindasis lohita, Horsf.* By
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PLATE XXII.

THIS pretty Lycænid, also known as *S. zebrinus*, Moore, is common in many localities near Macao and Hongkong, and no doubt occurs all over South China, within the range of the food-plants of the larva. It is on the wing from about March to November inclusive, sometimes appearing in dozens at the flowers of certain trees and shrubs, though it does not seem to care about other flowers. It has an exceedingly swift, erratic flight, and when settled, frequently head downwards, is continually working the large anal lobes of the hind-wings, hollowing and smoothing them, by rubbing the hind-wings together with a see-saw motion as it sits with closed wings. It frequents the outskirts of woods and open, bushy ground, where the food-plants of the larva grow, and where the trees are in flower which attract the butterfly.

The larval state is the most interesting and singular part of the life-history of this Lycænid, and judging from that it would seem to be very nearly allied to the Australian genus *Ogyris*, a very interesting paper on which genus, entitled "A Monograph of the genus *Ogyris*," appeared in the Trans. Ent. Soc. for 1905. Much of the information therein regarding the larval habits of species of *Ogyris* would apply without alteration to the larva of *Spindasis lohita*.

The egg is hemispherical or domed, flattened on the under-side, strongly reticulated or honeycombed on the upper surface. It is laid singly, during the day, into the joints of bracts, stems or leaves of the food-plants of the larva, or even on adjacent parts of the host-plants. The usual food-plant is *Henslowia frutescens*, Champ. (Nat. Ord. *Santalaceæ*) a very common trailing or half-climbing shrub in this part of Kwangtung, a parasite on the roots of other vegetation. The larva also feeds on *Loranthus chinensis*, D.C., and *Viscum orientale*, Willd., both Nat. Ord. *Loranthaceæ*; the former a common bushy parasite on many trees,

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the latter not unlike the familiar British mistletoe, and of the same parasitic habits on various trees and shrubs, but it is not very common here.

The general colour of the upper-side of the full-grown larva in the wet season is yellowish, with a double, interrupted dorsal line of dark brown. Most of the third segment is dark brown. An indistinct transverse dorsal reddish bar on each segment, each side, surrounded with dark brown. Below these markings uniform greenish-yellow, the whole body irrorated with light and dark specks, the whitish ones chiefly due to extremely short hairs or stubble. The second segment is covered with a dark brown shiny, chitinous shield, as is the last segment. On the twelfth segment are two dark brown chitinous tubulures, one each side, with a few hairs on the edges of the openings. From these tubulures the larva when irritated extrudes a white gland or stout filament which it vibrates rapidly and quickly withdraws again. The body is fringed laterally just above the legs with stiff white hairs.* Legs, prolegs, and under-side glaucous-green. Head nearly black. During the dry season the larvæ are very dark in general colouring, chiefly various shades of brown, with the wet season markings very obscure.

When feeding, the larvæ often secure two leaves slightly together with silk, forming a shelter but not entirely hiding the larvæ. The first lot of larvæ I reared, bred from eggs or captured between their leaf-shelters on the food-plants (where they occasionally seem to remain all day) arrived safely at full growth, ready to pupate, when though much distended they seemed soft and flabby, and burst at the lightest touch; perhaps from the lack of ants to suck away superfluous juices; they all died, as I had kept no ants with them. But later I discovered larvæ actually inside the nests of the ants, as well as pupæ, and thereafter kept ants with the larvæ, which were successfully reared. They are, however, liable to a fungoid growth which kills many, especially in the dry season, where the larval stage lasts a long time and the larvæ feed very slowly.

Apparently only one species of ant attends on the larvæ, at least in this district; small, and very dark red in colour, almost brown; but all three plants mentioned before swarm

* All bristles on the larva are roughened, or minutely spined up the stems.

with several kinds of ants, and are attractive to many other creatures, notably spiders. During the day the larvæ either remain in their leaf-shelters, as observed before, or more frequently in the ant-nests; especially in the latter, it would appear, in the dry season, when in January and February there is often much really cold weather. Some of these ant-nests are a fair size, but most of them very small; often made of one leaf with the edges turned up and roofed over with felted material; or two or three leaves are employed. Very often a succession of small nests encircle a slender branch, especially at the junctions of twigs; or they envelop a stalk and leaf or berry of the mistletoe—each little nest containing some aphides and ants, and occasionally a larva or two larvæ of *Spindasis*. The ant-nests are built of masticated vegetable matter, rather like the “paper” of a wasps’ nest, but the material is much thicker and coarser. The ants seem to make use of anything handy, however, as my attention was once drawn to the peculiar blue tint of some nests; but an old blue rag torn from some coolie’s raiment was hanging close by in the shrub, which had been chewed up and used in the construction of the nests.

The larvæ issue forth from their shelters at night to feed, and are constantly attended by some of the ants, who often stand on the back of a larva, apparently caressing it with their antennæ, and seeming to extract some juice from between the joints of the chitinous shields and the soft parts of the body; but chiefly they excite or irritate the larva by touching the tubulures with antennæ and fore-legs, till the larva puts forth the filaments from the tubes, and the ants then seem to lick up some moisture left by the filaments on the edges of the openings.* The larva can extrude the filaments either together or independently. Just before pupation the ants seem to tap the larva almost continuously, and the latter puts forth the filaments frequently and withdraws them more slowly than usual. The ants often crowd on the larva when the latter is feeding, and it is rarely left unattended for more than a few moments, even proceeding to its feeding-ground and returning home with ants on its back.

And thus the larvæ spend their time till they pupate,

* If the larva at first refuses to oblige the ant, the latter redoubles its attentions with its antennæ, and strikes on the back of the larva with one of its feet.

which they generally do in a deserted leaf-nest of the ants; or perhaps the latter kindly vacate their premises on purpose.* The nests used for pupation always seem quite new, though I have not found any ants actually inside the nests containing the pupæ; they may make occasional visits, however, though my butterflies emerge in good condition when the pupæ are isolated from ants. No doubt the safety of the pupa is well assured from the fact of its being concealed in what to all appearance is an inhabited ants' nest; few creatures would willingly disturb it, except woodpeckers and some few habitual feeders on ants. There is but one fairly common species of woodpecker here, and considering the abundance of large ants' nests everywhere, it is not probable that these birds trouble about the small leaf and twig nests occupied by *Spindasis*. The only other animals here, so far as I know, which feed largely on ants are the Pangolin or Scaly Ant-eater, and the Hoopoe, the former scarce and probably feeding only on the ground, and the bird being of rare occurrence here.

The pupa is dark shiny brown and yellow-brown, the tip of the abdomen blunt and rounded, and on the under-side is a roughened sub-circular patch, furnished with microscopic bristles, which aid the adhesion of the silk by which the pupa is affixed to one of the walls of the leaf-nest. There is no girdle round the middle. The tubulures of the larva are represented by two slight scars in the pupa.

The tubulures are really more distinct or conspicuous in the young than in the full-grown larvæ. The young larvæ generally eat away the under-side of the leaves in patches, leaving the thin upper skin.

* Sometimes, if the larva can find a suitable leaf shrivelled into a small tube (as the thick, fleshy leaves of the food-plants often are), it lines the tube with a loose-textured web and makes its own shelter.

EXPLANATION OF PLATE XXII.

[See *Explanation facing the PLATE.*]